

What is claimed is:

1. A method of conserving organic and inorganic materials, the method comprising:

(I) Impregnating a material selected from

- a. organic materials or
- b. inorganic materials

with a curable polymeric system comprising (i) a siloxane polymer or a mixture of siloxane polymers having an average of at least two silanol groups per molecule and (ii) sufficient crosslinker or a mixture of crosslinkers to crosslink a significant portion of the siloxane polymer or mixture of siloxane polymers (i), and thereafter,

(II) exposing the product of (I) to a catalyst or a mixture of catalysts for a time sufficient to initiate curing of the product of (I), wherein the crosslinkers are selected from the group consisting of hydrolyzable silanes selected from the group having the formulae

- 1. $\text{RSi}(\text{OR}')_3$,
- 2. $\text{RSi}(\text{OX})_3$,
- 3. $\text{RSi}(\text{OCOR}')_3$
- 4. $\text{RSi}(\text{OCOR}')_n(\text{OR}')_{3-n}$, wherein n has a value of 1 or 2 or,
- 5. mixtures of 1 to 4;

wherein R in each case is selected from the phenyl group, hydrogen, vinyl, or an alkyl group having from 1 to 12 carbon

atoms, R' in each case is selected from hydrogen, vinyl, or an alkyl group having from 1 to 8 carbon atoms, and OX is an oximo group.

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2. A method of conserving organic and inorganic materials, the method comprising:

(I) Impregnating a material selected from

- a. organic materials or
- b. inorganic materials

with a curable polymeric system comprising (i) a siloxane polymer or a mixture of siloxane polymers having an average of at least two silanol groups per molecule and (ii) sufficient crosslinker or a mixture of crosslinkers to crosslink a significant portion of the siloxane polymer or mixture of siloxane polymers (i), and thereafter,

(II) exposing the product of (I) to a catalyst or a mixture of catalysts for a time sufficient to cure the product of (I), wherein the crosslinkers are selected from the group consisting of hydrolyzable silanes selected from the group having the formulae

1. $\text{RSi}(\text{OR}')_3$
2. $\text{RSi}(\text{OX})_3$
3. $\text{RSi}(\text{OCOR}')_3$
4. $\text{RSi}(\text{OCOR}')_n (\text{OR}')_{3-n}$ wherein n has a value of 1 or 2 or
5. mixtures of 1 to 4;

wherein R in each case is selected from the phenyl group, hydrogen, vinyl, or an alkyl group having from 1 to 12 carbon

atoms, R' in each case is selected from hydrogen, vinyl, or an alkyl group having from 1 to 8 carbon atoms, and OX is an oximo group.

3. The method as claimed in claim 2 wherein the hydrolyzable silane is isobutyltrimethoxysilane.

4. A method as claimed in claim 2 wherein the hydrolyzable silane is an oximosilane.

5. A method as claimed in claim 4 wherein the oximosilane is methyltrioximosilane.

6. A method as claimed in claim 2 wherein the hydrolyzable silane is an acetoxysilane.

7. A method as claimed in claim 6 wherein the acetoxysilane is methyltriacetoxysilane.

8. A method as claimed in claim 2 wherein there is more than one crosslinker.

9. A method as claimed in claim 8 wherein there is two crosslinkers and they are both acetoxysilanes.

10. A method as claimed in claim 9 wherein the acetoxysilanes are methylacetoxysilane and ethylacetoxysilane and they are present in a weight ratio of about 50:50.

11. A method as claimed in claim 2 wherein the impregnation is assisted by negative pressure.

12. A method as claimed in claim 2 wherein the impregnation is assisted by positive pressure.

13. A method as claimed in claim 2, wherein the material selected for (I) is an organic material.

14. A method as claimed in claim 13, wherein the organic material is leather.

5 15. A method as claimed in claim 13, wherein the organic material is wood.

16. A method as claimed in claim 13, wherein the organic material is human body tissue.

10 17. A method as claimed in claim 13, wherein the organic material is non-human body tissue.

18. A method as claimed in claim 13, wherein the organic material is plant material.

19. A method as claimed in claim 13, wherein the organic material is bone.

15 20. A method as claimed in claim 13, wherein the organic material is paper.

21. A method as claimed in claim 14, wherein the paper is a photograph.

20 22. A method as claimed in claim 2, wherein the material selected for (I) is an inorganic material.

23. A method as claimed in claim 22, wherein the inorganic material is glass.

24. A method as claimed in claim 22, wherein the inorganic material is ceramic.

25. A method as claimed in claim 22, wherein the inorganic material is pottery.

26. A product when prepared by the method of claim 2.

27. A method of preserving organic and inorganic materials, the method comprising:

(I) Impregnating a material selected from

a. organic materials or

b. inorganic materials

with a crosslinker or a mixture of crosslinkers sufficient to crosslink a significant portion of a siloxane polymer or a mixture of siloxane polymers having an average of at least two silanol groups per molecule;

(II) thereafter, impregnating the product of (I) with siloxane polymer or a mixture of siloxane polymers having an average of at least two silanol groups per molecule;

(III) thereafter, exposing the product of (II) to a catalyst or a mixture of catalysts for a time sufficient to initiate curing of the product of (II).

28. A product when prepared by the method of claim 27.

29. A method of preserving organic and inorganic materials, the method comprising:

(I) Impregnating a material selected from

a. organic materials or

b. inorganic materials

with a crosslinker or a mixture of crosslinkers sufficient to

crosslink a significant portion of a siloxane polymer or a mixture of siloxane polymers having an average of, at least two silanol groups per molecule;

(II) thereafter, impregnating the product of (I) with
5 a siloxane polymer or a mixture of siloxane polymers having an average of at least two silanol groups per molecule;

(III) thereafter, exposing the product of (II) to a catalyst or a mixture of catalysts for a time sufficient to initiate curing of the product of (II), and thereafter,

10 (IV) curing the product of (II).

30. A method as claimed in claim 29 wherein the impregnation in (I) is assisted by negative pressure.

31. A method as claimed in claim 29 wherein the impregnation in (I) is assisted by positive pressure.

32. A method as claimed in claim 29 wherein the impregnation in (II) is assisted by negative pressure.

33. A method as claimed in claim 29 wherein the impregnation in (ii) is assisted by positive pressure.

34. A method as claimed in claim 29 wherein both the impregnation
20 in (I) and (II) are assisted by negative pressure.

35. A product when prepared by the method of claim 29.

36. A method of preserving organic and inorganic materials, the method comprising:

(I) , Impregnating a material selected from

- a. organic materials or
- b. inorganic materials

with a siloxane polymer or a mixture of siloxane polymers having
5 an average of at least two silanol groups per molecule;

(II) thereafter, impregnating the product of (I) with
a crosslinker or a mixture of crosslinkers sufficient to crosslink
a significant portion of the siloxane polymer or a mixture
of siloxane polymers having an average of at least two silanol
10 groups per molecule;

(III) thereafter, exposing the product of (II) to a
catalyst or a mixture of catalysts for a time sufficient to
initiate curing of the product of (II).

37. A method of preserving organic and inorganic materials, the
15 method comprising:

(I) Impregnating a material selected from

- a. organic materials or
- b. inorganic materials

with a siloxane polymer or a mixture of siloxane polymers having
20 an average of at least two silanol groups per molecule;

(II) thereafter, impregnating the product of (I) with
a crosslinker or a mixture of crosslinkers sufficient to crosslink
a significant portion of the siloxane polymer or a mixture
of siloxane polymers having an average of at least two silanol
25 groups per molecule;

(III) thereafter, exposing the product of (II) to a catalyst or a mixture of catalysts for a time sufficient to initiate curing of the product of (II), and thereafter,

(IV) curing the product of (II).

38. A method of preserving organic and inorganic materials, the method comprising:

(I) Impregnating a material selected from

- a. organic materials or
- b. inorganic materials

with a cyclosiloxane or a mixture of cyclosiloxanes having an average of at least two silane hydrogens per molecule and thereafter,

(II) exposing the product of (I) to a catalyst or a mixture of catalysts for a time sufficient to initiate curing of the product of (I).

39. A product when prepared by the method of claim 38.

40. A method of preserving organic and inorganic materials, the method comprising:

(I) Impregnating a material selected from

- a. organic materials or
- b. inorganic materials

with a non-cyclic siloxane or a mixture of non-cyclic siloxanes having an average of at least two silane hydrogens per molecule and having a molecular weight of 10,000 g/mole or less, and thereafter,

(II) exposing the product of (II) to a catalyst or a mixture of catalysts for a time sufficient to initiate curing of the product of (II).

41. A method as claimed in claim 40 wherein there is additionally
5 present cyclic siloxanes or a mixture of cyclic siloxanes having an average of at least two silane hydrogens per molecule.

42. A method as claimed in claim 41 in which the cyclosiloxane is a cyclic trimer siloxane.

43. A method as claimed in claim 41 in which the cyclosiloxane
10 is a cyclic tetramer siloxane.

44. A method as claimed in claim 41 in which the cyclosiloxane is a cyclic pentamer siloxane.

45. A method as claimed in claim 41 in which the cyclosiloxane is a mixture of cyclosiloxanes.

46. A method of preserving organic and inorganic materials, the
15 method comprising:

- (I) Impregnating a material selected from
 - a. organic materials or
 - b. inorganic materials

20 with a siloxane polymer or a mixture of siloxane polymers having an average of at least two silanol groups per molecule and thereafter,

(II) exposing the product of (I) to a catalyst or a mixture of catalysts for a time sufficient to initiate curing of
25 the product of (I).

47. A method of preserving organic and inorganic materials, the method comprising:

(I) Impregnating a material selected from

a. organic materials or

b. inorganic materials

with a hydrolyzable silane or a mixture of hydrolyzable silanes and thereafter,

(II) exposing the product of (I) to a catalyst or a mixture of catalysts for a time sufficient to initiate curing of the product of (I).

48. A method as claimed in claim 47 wherein the hydrolyzable silane is tetraethylorthosilicate.

49. A method as claimed in claim 48 wherein there is additionally present an alkoxysilane or a mixture of alkoxysilanes having the general formula:



wherein R is selected from the phenyl group, hydrogen, vinyl, or an alkyl group having from 1 to 12 carbon atoms, R' is selected from hydrogen, vinyl, or an alkyl group having from 1 to 6 carbon atoms and, a has a value of 1 or 2.

50. A method as claimed in claim 49 wherein the hydrolyzable silane is isobutyltrimethoxysilane.

51. A method of preserving organic and inorganic materials, the method comprising:

(I) Impregnating a material selected from

a. organic materials or

b. inorganic materials

with a hydrolyzable silane or a mixture of hydrolyzable silanes and thereafter, curing the product of (I).

52. A method as claimed in claim 51 wherein the hydrolyzable silane is an oximosilane.

53. A method as claimed in claim 52 wherein the oximosilane is methyltrioximosilane.

54. A method as claimed in claim 51 wherein the hydrolyzable silane is an acetoxysilane.

55. A method as claimed in claim 54 wherein the acetoxysilane is methyltriacetoxysilane.

56. A method as claimed in claim 51 wherein there is present two or more hydrolyzable silanes.

57. A method as claimed in claim 56 wherein the two hydrolyzable silanes are acetoxysilanes.

58. A method as claimed in claim 57 wherein the acetoxysilanes are methylacetoxysilane and ethylacetoxysilane and they are present in a weight ratio of 50:50.

59. A method of conserving organic and inorganic materials, the method comprising:

(I) Impregnating a material selected from

- a. organic materials or
- b. inorganic materials

with a curable polymeric system comprising (i) a siloxane polymer
5 or a mixture of siloxane polymers having an average of at least
two silanol groups per molecule and (ii) sufficient crosslinker to
crosslink a significant portion of the siloxane polymer or mixture
of siloxane polymers (i), and thereafter, curing the product of
(I), wherein the crosslinker is selected from a group consisting
10 of $R''Si(Oxime)_3$ and $Si(Oxime)_4$ wherein R'' is selected from the
phenyl group, hydrogen, vinyl, or an alkyl group having from 1 to
12 carbon atoms.

60. The method of claim 59 wherein the curing is carried out in
the presence of a catalyst.

15 61. A method of conserving organic and inorganic materials, the
method comprising:

- (I) Impregnating a material selected from
 - a. organic materials or
 - b. inorganic materials

20 with a curable polymeric system comprising

(i) a siloxane polymer or a mixture of siloxane polymers
having an average of at least two unsaturated groups per molecule;

(ii) sufficient crosslinker or a mixture of crosslinkers to
crosslink a significant portion of the siloxane polymer or mixture
25 of siloxane polymers (i) wherein the crosslinker or crosslinkers

are comprised of organosilicon compounds having at least two hydrogens on silicon and are selected from the group consisting of

- (a) silanes,
- (b) siloxanes and
- (c) mixtures of (a) and (b) and,

(iii) a platinum catalyst,

and thereafter,

(II) allowing the product of (I) to cure.

62. A method of configuring wood products, the method comprising

- (I) impregnating the wood product with a curable system;
- (II) configuring the wood product to the desired shape, and
- (III) while maintaining the wood product in the configuration of (II), curing the curable system.

63. The method as claimed in claim 62 wherein the curable system is a siloxane polymer or a mixture of siloxane polymers having an average of at least two silanol groups per molecule and (ii) sufficient crosslinker or a mixture of crosslinkers to crosslink a significant portion of the siloxane polymer or mixture of siloxane polymers (i).

64. The method as claimed in claim 62 wherein the curable system is a cyclosiloxane or a mixture of cyclosiloxanes having an average of at least two silane hydrogens per molecule.

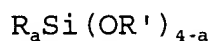
65. The method as claimed in claim 62 wherein the curable system is a non-cyclic siloxane or a mixture of non-cyclic siloxanes having an average of at least two silane hydrogens per molecule and having a molecular weight of 10,000 g/mole or less.

66. The method as claimed in claim 62 wherein the curable system is a siloxane polymer or a mixture of siloxane polymers having an average of at least two silanol groups per molecule.

67. The method as claimed in claim 62 wherein the curable system is a mixture of cyclosiloxanes.

68. The method as claimed in claim 62 wherein the curable system is a hydrolyzable silane or a mixture of hydrolyzable silanes.

69. The method as claimed in claim 62 wherein the curable system is an alkoxy silane or a mixture of alkoxy silanes having the general formula:



wherein R is selected from the phenyl group, hydrogen, vinyl, or an alkyl group having from 1 to 12 carbon atoms, R' is selected from hydrogen, vinyl, or an alkyl group having from 1 to 8 carbon atoms and, a has a value of 1 or 2, mixed with a tetraorthosilicate.

70. The method as claimed in claim 62 wherein the curable system is (i) a siloxane polymer or a mixture of siloxane polymers having an average of at least two silanol groups per molecule and (ii) sufficient crosslinker to crosslink a significant portion of the siloxane polymer or mixture of siloxane polymers (i), and

thereafter, curing the product of (I), wherein the crosslinker is selected from a group consisting of $R''Si(Oxime)_3$ and $R''Si(Oxime)_4$, wherein R'' is selected from the phenyl group, hydrogen, vinyl, or an alkyl group having from 1 to 12 carbon atoms.

71. The method as claimed in claim 62 wherein the curable system is

(i) a siloxane polymer or a mixture of siloxane polymers having an average of at least two unsaturated groups per molecule;

(ii) sufficient crosslinker or a mixture of crosslinkers to crosslink a significant portion of the siloxane polymer or mixture of siloxane polymers (i) wherein the crosslinker or crosslinkers are comprised of organosilicon compounds having at least two hydrogens on silicon and are selected from the group consisting of

(a) silanes,

(b) siloxanes and

(c) mixtures of (a) and (b) and,

(iii) a platinum catalyst,
and thereafter,

(II) allowing the product of (I) to cure.